

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet

1

of

1

Application Number

09/941,453

Filing Date

08/28/2001

First Named Inventor:

Fang-Cheng Chang

Examiner name: J. Mancuso
Mohamedvila

GROUP: 2623 (756)

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Attorney Docket Number

NTI-024

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U.S. PUBLISHED APPLICATION DOCUMENTS

Examiner Initials*	Cited No. ¹	U.S. Patent Document Number Kind Code ² (if known)		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines Where Relevant Info. Appear
SPM	A01	2001/0004122		Ito	06/21/2001	
SPM	A02	2001/0005619		A1	06/28/2001	

U.S. PATENT DOCUMENTS

Examiner Initials*	Cited No. ¹	U.S. Patent Document Number Kind Code ² (if known)		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines Where Relevant Info. Appear
SPM	B01	5597668		Nowak et al.	01/28/1997	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cited No. ¹	Foreign Patent Document Office ³ Number ⁴ Kind Code ⁵ (if known)		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines Where Relevant Info. Appear	T ⁶

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER Mohamedvila

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¹Unique citation designation number. ²See attached Kinds of U.S. Patent Documents. ³Enter Office that issued the document by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.



SHEET 1 of 3

INFORMATION DISCLOSURE CITATION PTO-1449		Atty. Docket No. NTI-024	Serial No. 09/941,453-6364			
		Applicant CHANG, Fang-Cheng				
		Filing Date 8/28/2001	Group <u>1756</u> Not Yet Assigned			
U.S. PATENT DOCUMENTS						
EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
<u>SLW</u>	6,016,357	1/18/2000	Neary, et al.	382	144	6/16/1997
<u>SLW</u>	6,023,328	2/8/2000	Pierrat	356	237.4	2/23/1998
<u>SLW</u>	6,076,465	6/20/2000	Vacca, et al.	101	481	9/19/1997
<u>SLW</u>	6,091,845	7/18/2000	Pierrat, et al.	382	144	2/24/1998
<u>SLW</u>	6,272,236	8/7/2001	Pierrat, et al.	382	144	7/18/2000
<u>SLW</u>	6,334,209-B1	12/25/2001	Hashimoto, et al.	716	21	9/2/1999
<u>SLW</u>	2002/0019729 A1	2/14/2002	Chang, et al.	703	6	8/7/1998

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SHEET 2 of 3

**INFORMATION DISCLOSURE
CITATION**
PTO-1449

Atty. Docket No. **NTI-024** Serial No. **09/941,453-6364**
 Applicant **CHANG, Fang-Cheng**
 Filing Date **8/28/2001** Group **1702**
Not Yet Assigned

FOREIGN PATENT DOCUMENTS

EXAMINER'S INITIALS	PATENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
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SMW	WO 97/13370	4/10/1997	WO	—	—	<input type="checkbox"/>	<input type="checkbox"/>
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SMW	WO 99/56113	11/4/1999	WO	AUG 20 2002	—	<input type="checkbox"/>	<input type="checkbox"/>
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SMW	WO 99/67626	12/29/1999	WO	—	—	<input type="checkbox"/>	<input type="checkbox"/>
SMW	WO 99/14706 A2/A3	3/25/1999	WO	—	—	<input type="checkbox"/>	<input type="checkbox"/>

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	Applicant CHANG, Fang-Cheng	Group Not Yet Designated
	Filing Date 8/28/2001	

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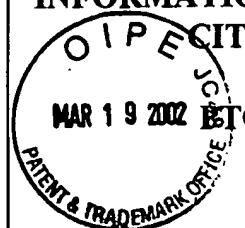
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)	
EXAMINER'S INITIALS	CITATION
	Spence, C., et al., "Detection of 60(degree) Phase Defects on Alternating PSMs", Advanced Micro Devices, KLA-Tencor, DuPont RTC (2 pages).
	Ogawa, K., et al., "Phase Defect Inspection by Differential Interference", Lasertec Corporation (12 pages).
	Socha, R., et al., "Printability of Phase-Shift Defects Using a Perturbational Model", Univ. of California Berkeley, Sematech (11 pages).
	Fickowsky, P., "The End of Thresholds: Subwavelength Optical Linewidth Measurement Using the Flux-Area Technique", Automated Visual Inspection (6 pages).
<i>SM</i>	Watanabe, H., et al., "Detection and Printability of Shifter Defects in Phase-Shifting Masks", Japanese Journal of Applied Physics, Vol. 30, No. 11B, pp. 3016-3020, November 1991.
<i>SM</i>	Hosono, K., et al., "A Novel Architecture for High Speed Dual Image Generation of Pattern Data for Phase Shifting Reticle Inspection", SPIE - Integrated Circuit Metrology, Inspection, and Process Control VI, Vol. 1673, pp. 229-235 (1992).
<i>SM</i>	Ohtsuka, H., et al., "Evaluation of Repair Phase and Size Tolerance for a Phase-Shift Mask", J. Vac. Sci. Technol. B, Vol. 11, No. 6, pp. 2665-2668, November/December 1993.
<i>SM</i>	Reynolds, J., "Elusive Mask Defects: Reflectivity Variations", Solid State Technology, pp. 75-76, March 1995.
<i>SM</i>	Kusunose, H., et al., "Direct Phase-Shift Measurement with Transmitted Deep-UV Illumination", SPIE, Vol. 2793, pp. 251-260 (1996).
<i>SM</i>	Fickowsky, P., et al., "Defect Printability Measurement on the KLA-351: Correlation to Defect Sizing Using the AVI Metrology System", SPIE 19th Annual RACUS Symposium on Photomask Technology and Management Conference, pp. 1-6, September 1999.
<i>SM</i>	Tejnil, E., et al., "Option for At-Wavelength Inspection of Patterned Extreme Ultraviolet Lithography Masks", SPIE Bacus '99, pp. 1-12 (1999).
<i>SM</i>	Hemar, S., et al., "Finding Killer CD Variations by Full-Reticle CD Mapping", Microlithography World, pp. 4, 6, 8 & 10 (Summer 2000).

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INFORMATION DISCLOSURE CITATION 		Atty. Docket No. NTI-024	Serial No. 09/941,453-6364
		Applicant CHANG, Fang-Cheng	
		Filing Date 8/28/2001	Group <i>1752</i> Not Yet Assigned

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U.S. PATENT DOCUMENTS

EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
SLW	5,326,659	7/5/1994	Liu, et al.	430	5	3/5/1992
↑	5,340,700	8/23/1994	Chen, et al.	430	312	11/3/1993
	5,432,714	7/11/1995	Chung, et al.	364	525	9/2/1994
	5,572,598	11/5/1996	Wihl, et al.	382	144	2/25/1994
	5,795,688	8/18/1998	Burdorf, et al.	430	30	8/14/1996
	5,801,954	9/1/1998	Le, et al.	364	488	4/24/1996
	5,804,340	9/8/1998	Garza, et al.	430	5	12/23/1996
	5,815,685	9/29/1998	Kamon	395	500	9/15/1995
	5,825,647	10/20/1998	Tsudaka	364	167.03	3/12/1996
	5,849,440	12/15/1998	Lucase, et al.	430	5	1/29/1997
	5,862,058	1/19/1999	Samuels, et al.	364	491	5/16/1996
	5,900,338	5/4/1999	Garza, et al.	430	5	8/15/1997
	6,009,250	12/28/1999	Ho, et al.	395	500.06	9/30/1997
	6,009,251	12/28/1999	Ho, et al.	395	500.06	9/30/1997
	6,011,911	1/4/2000	Ho, et al.	395	500.06	9/30/1997
↓	6,078,738	6/20/2000	Garza, et al.	395	500.22	5/8/1997
↓	6,081,659	6/27/2000	Garza, et al.	395	500.22	4/26/1999
SLW	6,171,731 B1	1/9/2001	Medvedeva, et al.	430	5	1/20/1999

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INFORMATION DISCLOSURE CITATION 	Atty. Docket No.	Serial No.
	NTI-024	09/941,453-6244
	Applicant	CHANG, Fang-Cheng
	Filing Date	Group 175 8/28/2001 Not Yet Assigned

FOREIGN PATENT DOCUMENTS

EXAMINER'S INITIALS	PATENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
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SPW	WO 00/36525 A2	6/22/2000	WO	1	1	<input type="checkbox"/>	<input type="checkbox"/>
SPW	WO 00/67074 A1	11/9/2000	WO	1	1	<input type="checkbox"/>	<input type="checkbox"/>
SPW	WO 00/67075 A1	11/9/2000	WO	1	1	<input type="checkbox"/>	<input type="checkbox"/>
SPW	WO 00/67076 A1	11/9/2000	WO	1	1	<input type="checkbox"/>	<input type="checkbox"/>

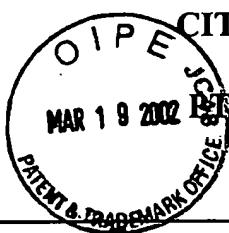
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INFORMATION DISCLOSURE CITATION 		Atty. Docket No. NTI-024	Serial No. 09/941,453-6364
		Applicant CHANG, Fang-Cheng	
		Filing Date 8/28/2001	Group 178 Not Yet Assigned
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
EXAMINER'S INITIALS	CITATION		
	Cobb, et al., "Fast Sparse Aerial Image Calculation for OPC", SPIE, Vol. 2621, pp. 534-544.		
	Strimman, J., et al., "Spatial Filter Models to Describe IC Lithographic Behavior", Precim Corporation, Portland, Oregon (10 pages).		
	Sugawara, M., et al., "Defect Printability Study of Attenuated Phase-Shifting Masks for Specifying Inspection Sensitivity", Sony Corporation, Kanagawa, Japan (16 pages).		
	Adam, K., et al., "Simplified Models for Edge Transitions in Rigorous Mask Modeling", University of California Berkeley (40 pages).		
	Gordon, R., et al., "Mask Topography Simulation for EUV Lithography", FINLE Technologies Inc. (15 pages).		
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	Semmier, A., et al., "Application of 3D EMF Simulation for Development and Optimization of Alternating Phase Shifting Masks", Infineon Technologies AG (12 pages).		
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SDW	Casey, Jr., J.D., et al., "Chemically Enhanced FIB Repair of Opaque Defects on Molybdenum Silicide Photomasks", SPIE, Vol. 3236, pp. 487-497 (1997).		
SPW	Mathur, B.P., et al., "Quantitative Evaluation of Shape of Image on Photoresist of Square Apertures", IEEE, Transactions On Electron Devices, Vol. 35, No. 3, pp. 294-297, March 1988.		
SPW	Neureuther, A., "Modeling Phase Shifting Masks", SPIE, 10th Annual Symposium On Microlithography, Vol. 1496, pp. 80-85 (1990).		
SPW	Henke, W., et al., "A Study of Reticle Defects Imaged Into Three-Dimensional Developed Profiles of Positive Photoresist Using the Solid Lithography Simulator", Microelectronics Eng., Vol. 14, pp. 283-297 (1991).		
SPW	Wiley, J., et al., "Phase Shift Mask Pattern Accuracy Requirements and Inspection Technology", SPIE, Integrated Circuit Metrology, Inspection, And Process Control V, Vol. 1464, pp. 346-355 (1991).		

EXAMINER: Mohamed J. Ishaq

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INFORMATION DISCLOSURE 	Atty. Docket No.	Serial No.
	NTI-024	09/941,453-6364
	Applicant	CHANG, Fang-Cheng
	Filing Date	Group 1752 8/28/2001 Not Yet Assigned

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EXAMINER'S INITIALS	CITATION
AM	Ham, Y.M., et al., "Dependence of Defects in Optical Lithography", Jpn. J. Appl. Phys., Vol. 31, pp. 4137-4142 (1992).
SPW	Ohtsuka, H., et al., "Phase Defect Repair Method for Alternating Phase Shift Masks Conjugate Twin-Shifter Method", Jpn. J. Appl. Phys., Vol. 31, pp. 4143-4149 (1992).
SKW	Watanabe, H., et al., "Detection and Printability of Shifter Defects in Phase-Shifting Masks II Defocus Characteristics", Jpn. J. Appl. Phys., Vol. 31, pp. 4155-4160 (1992).
SPW	Crisalle, O., et al., "A Comparison of the Optical Projection Lithography Simulators in SAMPLE and PROLITH", IEEE, Transactions On Semiconductor Manufacturing, Vol. 5, No. 1, pp. 14-26, February 1992.
SPW	Nistler, J., et al., "Phase Shift Mask Defect Printability Analysis", Proceedings Of The Microlithography Seminar INTERFACE '93, OCG Microelectronic Materials, Inc., pp. 11-28 (1993).
	Rieger, M., et al., "System for Lithography Proximity Compensation", Precim Company, Portland, Oregon, September 1993 (28 pages).
SPW	Wiley, J., et al., "Device Yield and Reliability by Specification of Mask Defects", Solid State Technology, Vol. 36, No. 7, pp. 65-66, 70, 72, 74, 77, July 1993.
SPW	Nistler, J., et al., "Large Area Optical Design Rule Checker for Logic PSM Application", SPIE, Photomask And X-Ray Mask Technology, Vol. 2254, pp. 78-92 (1994).
AM	Pati, Y.C., et al., "Phase-Shifting Masks for Microlithography: Automated Design and Mask Requirements", J. Opt. Soc. Am., Vol. 11, No. 9, pp. 2438-2452, September 1994.
SPW	Spence, C., et al., "Automated Determination of CAD Layout Failures Through Focus: Experiment and Simulation", SPIE, Vol. 2197, pp. 302-313 (1994).
SPW	Qian, Q.D., et al., "A New Scalar Planewave Model for High NA Lithography Simulations", IEEE, pp. 45-48 (1994).
SPW	Karklin, L., "A Comprehensive Simulation Study of the Photomask Defects Printability", SPIE, Vol. 2621, pp. 490-504 (1995).
SPW	Wiley, J., et al., "The Effect of Off-Axis Illumination on the Printability of Opaque and Transparent Reticle Defects", SPIE, Vol. 2512, pp. 432-440 (1995).
SPW	Brunner, T., et al., "Approximate Models for Resist Processing Effects", SPIE, Vol. 2726, pp. 198-207, March 1996.

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INFORMATION DISCLOSURE CITATION 	Atty. Docket No.	Serial No.
	NTI-024	09/941,453-6364
	Applicant	CHANG, Fang-Cheng
	Filing Date	Group 175b 8/28/2001 Not Yet Assigned

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER'S INITIALS	CITATION
<i>PL</i>	Chang, K., et al., "Accurate Modeling of Deep Submicron Interconnect Technology", TMA Times, Vol. IX, No. 3 (1997).
<i>CM</i>	Gans, F., et al., "Printability and Repair Techniques for DUV Photomasks", SPIE, Proceedings Of The 17th Annual Symposium On Photomask Technology And Management, Vol. 3236, pp. 136-141 (1997).
<i>SLW</i>	Ibsen, K., et al., "Clear Field Reticle Defect Diposition for Advanced Sub-Half Micron Lithography", SPIE, Proceedings Of The 17th Annual Symposium On Photomask Technology And Management, Vol. 3236, pp. 124-135 (1997).
<i>SLW</i>	Pati, Y.C., et al., "Exploiting Structure in Fast Aerial Image Computation for Integrated Circuit Patterns", IEEE Transactions On Semiconductor Manufacturing, Vol. 10, No. 1, pp. 62-74, February 1997.
<i>SLW</i>	Vacca, A., et al., "100nm Defect Detection Using a Dynamically Programmable Image Processing Algorithm", SPIE, Vol. 3236 (1997) (Abstract Only).
<i>SLW</i>	Kubota, H., et al., "A Fast Method of Simulating Resist Pattern Contours Based on Mean Inhibitor Concentration", Jpn. J. Appl. Phys., Vol. 37, pp. 5815-5820 (1998).
<i>SLW</i>	Vacca, A., et al., "100nm Defect Detection Using an Existing Image Acquisition System", SPIE, Vol. 3236, pp. 208-21 (1998).
<i>SLW</i>	Fukuda, H., et al., "Determination of High-Order Lens Aberration Using Phase/Amplitude Linear Algebra", J. Vac. Sci. Technol. B, Vol. 17, No. 6, pp. 3318-3321, November/December 1999.
<i>SLW</i>	Fukuda, H., "Node-Connection/Quantum Phase-Shifting Mask: Path to Below 0.3um Pitch, Proximity Effect Free, Random Interconnects and Memory Patterning", J. Vac. Sci. Technol. B, Vol. 17, No. 6, pp. 3291-3295, November/December 1999.
<i>SLW</i>	Balasinski, A., et al., "A Novel Approach to Simulate the Effect of Optical Proximity on MOSFET Parametric Yield", IEEE, pp. 37.6.1-37.6.4 (1999).
<i>SLW</i>	Balasinski, A., et al., "Comparison of Mask Writing Tools and Mask Simulations for 0.16um Devices", IEEE, SEMI Advanced Semiconductor Manufacturing Conference, pp. 372-377 (1999).

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		Applicant CHANG, Fang-Cheng				
		Filing Date 8/28/2001	Group 170 -2623			
U.S. PATENT DOCUMENTS						
EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
SLW	6,130,750	10/10/2000	Ausschnitt, et al.	356	401	8/28/1997
SLW	6,346,426 B1	2/12/2002	Toprac, et al.	438	8	11/17/2000

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	Applicant	CHANG, Fang-Cheng
	Filing Date	Group 8/28/2001 2623 1706

U.S. PATENT DOCUMENTS

EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
SNM	2002/0164064 A1	11/7/2002	Karklin, et al.	382	145	3/20/2001
SNM	2002/0164065 A1	11/7/2002	Cai, et al.	382	149	3/20/2001

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8/28/2001	2623-1756	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER'S INITIALS	CITATION
SMW	Lin, B.J., et al., "Single-Level Electric Testsites for Phase-Shifting Masks", SPIE, Vol. 1673, pp. 221-228, March 9-11, 1992.

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